

REMARKS

Claims 1-17 are pending in the present application. The Office Action and cited references have been considered. Favorable reconsideration is respectfully requested.

Claims 2-9 were objected to as being in improper dependent form. Claims 2-9 have been amended to clarify the invention. In particular, it is now clear that the control means are configured to operate to provide the claimed functions. Thus, the claims now include structure to provide the recited functions, and are thus properly dependent claims. Withdrawal of this objection is respectfully requested.

Claims 1-17 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant has amended claims 5, 8, 9, and 13 to provide proper antecedent basis for the limitations noted in the rejection. With respect to the rejection of claim 15, a rejection is respectfully traversed. Page 13, lines 12-19 describe the parallel outlets SP. Applicant submits that upon reviewing figures 7, which shows the parallel outlets SP can be above quote cited description thereof, one of ordinary skill in the art would understand the scope of the claimed invention defined by claim 15. Moreover, the claim language is clear on its face. Claim 15 refers to each of the modules comprising a duct which opens outside via an orifice constituting a parallel outlet. One of ordinary skill in the art would understand that since there is more than one module and each of the modules comprise an orifice, the orifices are parallel outlets with respect to one another.

Thus, between the claim language itself and the disclosure in the specification and drawings, one of ordinary skill in the art would understand the scope of the invention.

Claims 1-9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Paatzsch et al. (U.S. Patent No. 3,666,420) in view of Melet (U.S. Patent No. 6,555,065) and Phelan (U.S. Patent No. 3,800,984). Claims 10 and 12-15 were rejected under 35 U.S.C. §103(a) as being unpatentable over Paatzsch, Melet and Phelan and further in view of Goldsmith (U.S. Patent No. 3,572,130). Claim 11 was rejected under 35 U.S.C. §103(a) as being unpatentable over Paatzsch, Melet, Phelan and further in view of Hennessy (U.S. Patent No. 4,729,876). Claims 16-17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Paatzsch, Melet, Phelan and further in view of Richards (U.S. Patent No. 6,405,609). These rejections are respectfully traversed for the following reasons.

Claim 1 recites automatic precision drawing-off device comprising at least first and second pumping units having a respective first and second working chambers whose volumes vary according to the axial position of two respective rod/piston units which slide in the working chambers, the rod/piston units being coupled to an actuation member driven -by a common motor, the working chambers being connected to a circuit successively comprising a pipe opening into a rinsing liquid reserve, first and second successive electrovalves and a circuit portion connecting the second electrovalve to drawing-off means, the first working chamber being connected to the circuit in a region forming a link between the first electrovalve and the second electrovalve, the second working chamber being connected to the circuit portion by means of a connector, wherein the circuit portion comprises a third electrovalve located between said connector and the

drawing-off means, the electrovalves and the motor being controlled by control means configured to obtain at least a drawing cycle from an initial status where the drawing-off means is engaged in a receptacle, the first and second electrovalves are open and the third electrovalve is closed, the motor is stopped, the rod/piston units are in an idle position. The control means comprises means for controlling the drawing cycle to include a first transitory step in which the rod/piston units are driven by the motor in a first direction to create a sucking of the rinsing liquid into the two working chambers while the elements of the kinematic chain are in abutment against one another, a drawing-off phase obtained by closing the second electrovalve and by opening the third electrovalve the two rod/piston units being moved in the first direction so that the first pumping unit sucks up the rinsing liquid contained in the reserve and the second pumping unit creates suction of the product contained in the receptacle inside the drawing-off means, and a second transitory phase marked by the closure of the third electrovalve and the opening of the second electrovalve so that the drawing-off phase is ended whereas the motor continues to drive the rod/piston units in the first direction thus provoking a suction by the two chambers of the rinsing liquid derived from the reserve, the motor being stopped at the end of this second transitory phase. This is not taught, disclosed or made obvious by the prior art of record.

As stated in Applicant's specification, the purpose of the claimed invention is to eliminate the drawbacks due to the mechanical play in the kinematic chain, i.e., the elements in the motor, by carrying out the sampling phase and/or flow back phase when the rod/piston units are currently moving in either direction after the inversion or starting transitory phases, and/or stoppage of the transitory phases. In this way, the teeth of the

pinions and the racks of the kinematic chain, which mutually gear are firmly in support against one another and thus the mechanical play between those elements through normal wear and tear, (even if it exists) does not appear during these periods.

Applicant's invention as recited in the amended claim 1 overcomes these drawbacks by using a supplemental electrovalve R_3 as well as a control means configured to control said electrovalves in order to obtain at least a drawing cycle from an initial status where the needle AP is engaged in the reserve RE, the valves EV_1 , EV_2 are open and EV_3 is closed, the motor being stopped, and the piston being in an idle position (position O), the control means configured to provide a drawing cycle that includes the following steps:

a transitory step wherein the motor MP is driven in a first direction (negative direction) to move the two pistons and create a sucking of the rinsing liquid into the two working chambers (in this step the incidence of the play present in the kinematic chain (which provokes a slight shift in suction) has no negative effect on the functioning (accuracy) of the device);

a drawing-off phase obtained by closing the second valve EV_2 and by opening the valve EV_3 , the two pistons being always moved in the first direction, the piston P' creating suction of the liquid contained in the reserve RE inside the needle AP and a portion of the flexible tube TS, whereas the piston P sucks up the rinsing liquid contained in the reserve RL (in this step, this drawing-off phase is not subjected to the effect of the play of the kinematic chain: the pinions (or the like) are firmly in abutment against one another); and

a second transitory phase marked by the closing of the valve EV_3 and the opening of the valve EV_2 so that drawing-off phase is ended whereas the motor, which continues to rotate, provokes suction by the two chambers of the rinsing liquid derived from the reserve RL, the motor being stopped at the end of this second transitory phase.

The above mentioned mechanical problems are not raised in the Examiner's citations so that these citations cannot evoke Applicant's solution, which proposes for obtaining a high level of accuracy in spite of mechanical play in the kinematic chain using a third electrovalve and control means configured to drive the electrovalves according to an appropriate sequence.

Applicant respectfully submits that a person of ordinary skill in the art, who has to solve mechanical problems of play in a kinematic chain that alters the accuracy of a device, will try to reduce this play mechanically and will not use an electrovalve without apparent relation with this play (or even with the kinematic chain). For this reason, the proposed solution is not only not taught in the cited prior art, but would not have been obvious from the teachings of that art.

In particular, as stated in the Office Action, Paatzsch et al. does not disclose either a common rotating motor for driving simultaneously the rod/piston units of the pumps nor a third electrovalve. Applicant respectfully submits that Paatzsch does not disclose any problems resulting from a play in the kinematic chain between the common motor and the rod/piston units. Therefore, Paatzsch does not and cannot suggest any solution to this problem.

The Office Action cites Melet as allegedly teaching the third electrovalve absent from Paatzsch. Applicant respectfully disagrees. Melet concerns a hematologic counting and analysing device adapted to automatically measure platelets, red corpuscles, white corpuscles and hemoglobin in blood. This device comprises a pumping assembly including an air pump driven by a first motor and three pumps for lysis, diluent and sampling, respectively, actuated by a second motor. These pumps are connected to a complex circuit using a large number of electrovalves, i.e., more than the three claimed in the present application. The sole circuit of Melet that can be even arguably compared with Applicant's pipetting circuit is the circuit which connects the pump having the piston 13 to the needle 1. However, this circuit is in fact patentably different from Applicant's pipetting circuit. As with Paatzsch, Merlet does not raise any mechanical play problem and does not suggest any solution to solve such a problem. For this reason alone, the combination of the teaching of Paatzsch and of Merlet does not and cannot suggest Applicant's solution to these problems.

Further, the electrovalve EV₁₅ used by Melet is a three way electrovalve having a first port connected to a means for dispensing a diluent on the external part of the needle 1, a second port connected to the pump 13, and a third port connected to a three way electrovalve EV₄. This three way valve EV₁₅ is not directly connected to the internal part of the needle 1, but through the pump 13, which is connected to the internal part of the needle by a direct circuit (not referenced but visible on fig. 1). Such a three way electrovalve EV₁₅ does not correspond to Applicant's electrovalve EV₃, which controls the circuit which connects the pumping unit 2 to the inside of the needle AP. It clearly appears that the

function of the three way electrovalve EV₁₅ is quite different from the function of Applicant's electrovalve EV₃ and that Merlet's circuit does not correspond at all to that of Applicant. For these reasons, Melet cannot be considered as a pertinent citation with respect to the device as claimed in the amended claim 1.

The Office Action cites Phelan as allegedly teaching common rotating motorization for driving the rod/piston units of the pumps absent from Paatzsch. Phelan concerns a mixing device which does not comprise a third electrovalve between the pump 12 and the pipette 46. This device is not intended to solve the same problems and cannot suggest Applicant's solution as recited in the amended claim 1. More particularly, there is nothing in Phelan which evokes the problem of the mechanical play in the elements between the rotor 42 and the assembly rod/pistons of the pumps 12 and 14. There is nothing in Phelan, or Paatzsch and Melet, which could conduce one skilled on the art to use a supplementary electrovalve so as to solve a problem of a mechanical nature.

The Office Action alleges that the functional language need not be given any patentable weight. However, Applicant has amended claim 1 to clarify that the claimed control means is the structure that performs the claimed function. The prior art does not disclose or suggest a control means which performs the recited functions, whether taken alone, or in combination as suggested in the Office Action.

For these reasons, the combination Paatzsch/Melet/Phelan is not pertinent against the amended claim 1.

Due to the fact that they fail to disclose any electrovalve having a same (or an equivalent) function as Applicant's third electrovalve and intended to obtain a similar

result, the above citations cannot be used to and are not capable of being control to provide the successive phases recited in Applicant's amended claim 1.

Goldsmith and Hennessy have been carefully considered. However, these patents do not remedy the deficiencies discussed above with respect to Paatzsch, Melet and/or Phelan et al. to conduce one skilled on the art toward Applicant's solution as recited in the amended claim 1.

For at least these reasons, Applicant respectfully submits that claims 1-17 are patentable over the prior art of record whether taken alone or in combination as proposed in the Office Action.

In view of the above amendment and remarks, Applicant respectfully requests reconsideration withdrawal of the outstanding rejections of record. Applicant submits that the application is in condition for allowance and early notice to the effect is most earnestly solicited.

If the Examiner has any questions, he is invited to contact the undersigned at 202-628-5197.

Respectfully submitted,

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